

**Example #7:** Carbon atoms of atomic mass 12.0 a.m.u. are mixed with atoms of another unknown material. In a mass spectrometer, the C-12 atoms follow a path of radius 22.4 cm, while the unknown atoms produce a 26.2-cm radius path. Assuming identical charges, what is the atomic mass of the unknown material?

$$m \propto r \quad (\text{see notes})$$

$$\begin{aligned} \text{so } m_{\text{unknown}} &= 12 \left[ \frac{26.2}{22.4} \right] \\ &= \boxed{14 \text{ a.m.u}} \end{aligned}$$

→ this is the mass of the atomic isotope carbon-14.